Diverticular Carcinoma of the Urinary Bladder: Diagnosis and Treatment Problems

A Case Report

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Key Words

Bladder diverticulum · Intradiverticular neoplasm ·
Pararectal tumor

Abstract

Objectives: To report a case of a primary carcinoma arising in a vesical diverticulum. **Clinical Presentation and Intervention:** A 59-year-old male patient presented with painless macrohematuria. A primary carcinoma arising in a vesical diverticulum was detected with cystoscopy and confirmed with rectal endosonography and computer tomography. and radical cystoprostatovesiculectomy with ileal conduit was performed. Chemotherapy with cisplatin and methotrexate followed. The patient died of an acute cardiac event in the 4th postoperative month. **Conclusion:** This report illustrates that in a case of a closed opening of a bladder diverticulum, rectal endosonography and computer tomography do provide additional support for making a diagnosis of a hidden tumor in the diverticulum.

Introduction

Primary neoplasms arising in vesical diverticula are rare; incidence varies from 0.8 to 13% [1]. As in other bladder tumors, diverticular neoplasms are most prevalent in men above the age of 40 years [1]. Most malignant tumors in vesical diverticula are of transitional type (about 78%), followed by squamous cell carcinoma (17%), a combination of transitional and squamous cell types (2%), and adenocarcinoma (2%). Rare tumor types have also been reported. Although cystoscopy is a reliable method for diagnosis of most diverticular neoplasms, certain diverticula are inaccessible or may be missed, particularly those with a narrow orifice. The relatively scarce documentation of this disease in the literature suggests an overall poor prognosis [2, 3].

In this report, the case of a patient with a primary carcinoma arising in a vesical diverticulum is presented.

Case Report

A 59-year-old man presented with painless macrohematuria. Digital-rectal palpation disclosed a pararectal tumor at 5 o'clock; the prostate serum antigen level was 1.1 ng/dl. Urine flow was not obstructed. No bladder tumor was detected during initial routine transvesical sonography of the bladder. Cystoscopy revealed a

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Fig. 1. Transvesical ultrasound: diverticular carcinoma.

Fig. 2. Invasive carcinoma of the diverticula of the left urinary bladder wall.

plane of suspected malignant urothelium in the left bladder wall without sign of a diverticular opening. Rectal endosonography documented a tumor with connection to the bladder. Repeated transvesical sonography (fig. 1) of the completely filled bladder together with computer tomography (CT) (fig. 2) provided reliable confirmation of an invasive carcinoma of the diverticula of the urinary bladder. Radical cystoprostatectomy with ileal conduit was performed. Tumor staging was pT3a, N2, M0, R0, G3. Subsequent chemotherapy with cisplatin and methotrexate followed. The patient died of an acute cardiac event in the 4th postoperative month.

Discussion

Vesical diverticula are congenital or acquired. Acquired diverticula are by far more common and are secondary to lower urinary tract obstruction, such as benign prostatic hyperplasia, vesical neck contracture, urethral stricture or neurogenic bladder [4]. The most likely site of a diverticulum is in the area adjacent to the ureteral

orifice where the longitudinal muscle fibers are absent and outpouching is facilitated [1]. Indications for surgical intervention include bleeding, infection, calculi, deterioration of the upper urinary tract owing to reflux or ureteral obstruction, and suspicion of malignancy within the diverticulum [5].

A search of the literature reveals that the incidence of neoplasms arising in a vesical diverticulum can vary from 0.8 to 13% [1]. However, this estimate may be falsely high since many small diverticula may not have been noted in the charts and an unknown proportion of vesical diverticula remain undiagnosed because they cause no symptoms [2, 5]. Painless hematuria is the cardinal symptom for diverticular tumors, as in ordinary bladder tumors. According to Melekos et al. [2], hematuria was present in 87.5% of patients with neoplasms occurring in the diverticula and in 100% of patients with tumors elsewhere in the bladder.

Diagnosis of vesical diverticula follows ultrasound, radiologic examination (intravenous pyelography and/or cystography) and cystoscopy. In cases of diverticula with narrowed openings, a tumor in a diverticulum may be overlooked. In these cases, CT, transvesical and transrectal ultrasound will be of benefit for detection of an intradiverticular tumor. MRI can be helpful in differentiating diverticular tumors from necrotic soft tissue masses. CT is of very limited value in determination of peridiverticular invasion [6, 7]. Biopsy of the tumor tissue is recommended during cystoscopy [8]. Urine cytologic examination is valuable in the diagnosis and monitoring of intradiverticular tumors. For diagnosis of a pararectal tumor, rectal endosonography is helpful.

Stasis of urine within poorly contractile bladder diverticula has been offered as an explanation for the observation that 80% of bladder diverticula are at sites of chronic irritation and inflammation [9–11]. These factors act as promoters of carcinogenesis [2, 10, 11]. According to Kappenberger et al. [12], when a tumor and a diverticulum coexist in the bladder, the tumor is likely to be within the diverticulum. However, this theory does not explain the same recurrence rate for intradiverticular and nondiverticular neoplasms in the bladder or why transitional cell carcinoma occurs and recurs at sites remote from the diverticulum in many patients [5, 9]. Because of the frequent combination of diverticulum and malignant tumor, prophylactic diverticulectomy has even been advocated by some and rejected by others [5, 11, 13]. In our opinion, prophylactic diverticulectomy is not justified. In general, all diverticula should be regarded as potential sources of hidden neoplasms and the interior of

all diverticula should be inspected carefully during cystoscopy [14]. Therefore digital-rectal examination is valuable not only for prostate diseases but should be compulsory for all patients presenting with urological disorders.

No type of treatment yields good results in cases of tumor within vesical diverticula. This poor prognosis is a result of difficulty in diagnosis (see above) and early invasion, which results from the anatomy of the diverticulum. Bladder diverticula are in most cases pseudodiverticula; they appear in areas deficient in muscle fibers and are composed of mucosa and serosa alone. The lack of muscular fibers in a diverticulum allows tumor invasion to proceed earlier and more easily in the perivesical tissue than in a normal bladder wall containing muscle tissue [2, 5, 8, 10]. This also raises the question of accurate staging. Because the muscle layer is deficient, or absent, it is unclear if invasion of the lamina propria (T1) should be synonymous in this case with stage T2/T3 disease in a normal bladder. At present, lack of sufficient data on this topic precludes the creation of a special staging system for diverticular tumors [14].

The value of therapeutic options of radical cystectomy and diverticulectomy has been discussed in the literature but remains controversial. Randomized prospective studies do not exist. According to Baniel et al. [14], superficial intradiverticular tumors may be treated conservatively, but when dealing with invasive bladder diverticula tumors (T1), disease management should probably be aggressive (radical cystectomy versus diverticulectomy), although the small number of cases precludes a clear recommendation of cystectomy versus local resection [11, 12, 15]. Kelalis and McLean [10] described a series of 19 patients with diverticular neoplasms treated primarily with surgical excision in which they noted a cancer-specific survival of 16% at 2 years. Faysal and Freiha [9] described 12 patients treated with surgical excision. They reported a cancer-specific survival of 25% and a disease-free survival of 8% with an average follow-up of 2.3 years. Micic and Ilic [3] reported on 13 patients treated with surgical excision and noted a cancer-specific survival of 46%. Montague and Boltuch [8] reported improved survival in a series of 10 patients with surgical excision and felt that early diagnosis and treatment was the reason for improved survival in their group. In view of the poor results with surgical monotherapy, Garzotto et al. [15] treated 9 patients with invasive bladder diverticular tumors with systemic chemotherapy and radiotherapy in combination with surgery, with significant benefit. Disease-specific survival was 89% with a mean follow-up of 4 years.

Prompt diagnosis and aggressive treatment for patients with this disease should improve the survival rate. As in patients with urothelial neoplasms at other sites, grades of tumor differentiation and depth of tumor invasion strongly influence survival.

Conclusion

This report illustrated the case of a patient with primary carcinoma arising in the vesical diverticulum, who despite radical treatment survived only a few months.

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